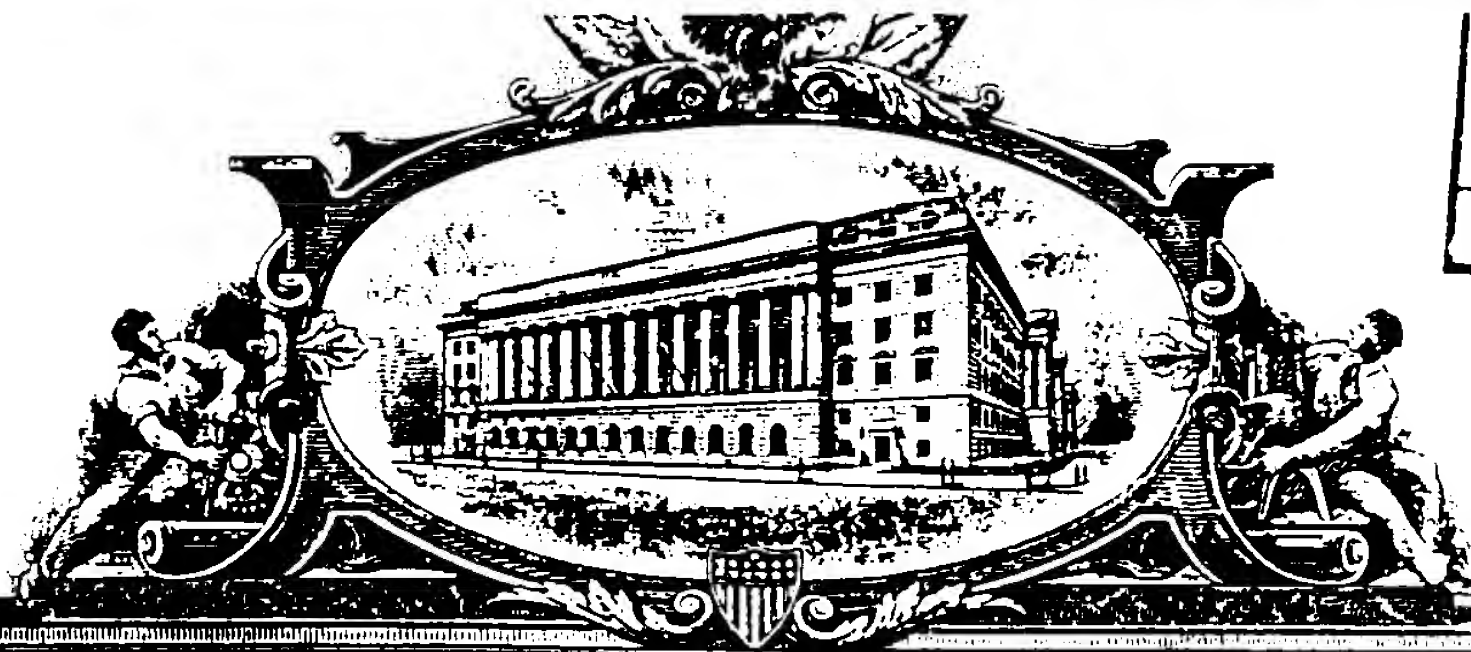P1 188351

THE UNITED STATES OF AMERICA

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APPLICATION NUMBER: *60/142,375*
FILING DATE: *July 06, 1999*
PCT APPLICATION NUMBER: *PCT/US99/26562*

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Certifying Officer

This is a request for filing a **PROVISIONAL APPLICATION FOR PATENT** under 37 CFR §1.53(b)(2).

Docket No. 98,675-D	Type a plus sign (+) inside this box:	+

INVENTOR(S)/APPLICANTS(S)

LAST NAME	FIRST NAME	MIDDLE INITIAL	RESIDENCE (City and either state or foreign country)
Boyce	Keith		Pittsburgh, PA
McKenna	Brian		Pittsburgh, PA
Glick	Phil		Pittsburgh, PA

TITLE OF THE INVENTION (280 character maximum)

Data Management and Presentation Methods

CORRESPONDENCE ADDRESS

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STATE	Illinois	ZIP CODE	60606	COUNTRY	U.S.A.

ENCLOSED APPLICATION PARTS (check all that apply)

☒ Specification   Number of Pages __33__   ☒ Small Entity Statement

☒ Drawing(s)   Number of Sheets __within specification__   ☐ Other (specify):

METHOD OF PAYMENT FOR THIS PROVISIONAL APPLICATION FOR PATENT

☒ A check or money order is enclosed to cover the Provisional Filing Fee. The Commissioner is hereby authorized to charge filing fees and credit Deposit Account Number: 13-2490.	PROVISIONAL APPLICATION FOR PATENT FILING FEE AMOUNT ($)	75.00

The invention was made by an agency of the United States Government or under a contract with an agency of the United States Government.
__X__ No. _____ Yes, the name of the U.S. Government agency and the Government contract number are: _____

Respectfully submitted,
SIGNATURE: _____ Date: __July 6, 1999__

TYPED or PRINTED NAME __David Harper__ REG. NO. __42,636__

USE ONLY FOR FILING A PROVISIONAL APPLICATION FOR PATENT

Burden Hour Statement This form is estimated to take 2 hours to complete Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Office of Assistance Quality and Enhancement Division, Patent and Trademark Office, Washington, D.C. 20231, and to the Office of Information and Regulatory Affairs, Office of Management and Budget (Project 0651-00XX), Washington, D.C. 20503. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner of Patents and Trademarks, Washington, D.C 20231.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
(Case No. 98,675-D)

In re Application of:)
)
         Boyce et al.)

Serial No.:   To be Assigned)   Art Unit:
)   Examiner:

Filed: Herewith)
)

For: Data Management and Presentation Methods)

Asst. Commissioner for Patents
BOX PROVISIONAL APPLICATION
Washington, D.C. 20231

TRANSMITTAL LETTER

Sir:

1.   We are transmitting herewith the attached papers for the above identified new provisional patent application:

        ☒ Patent Specification (33 pages, including cover sheet, claims, and abstract)
        ☒ Drawings (within specification)
        ☒ Return Postcard
        ☒ Other: Provisional Application Cover Sheet, Verified Statement claiming small entity status
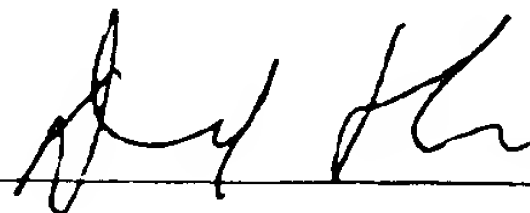
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4.   **CERTIFICATE OF MAILING BY "EXPRESS MAIL" UNDER 37 CFR § 1.10:** The undersigned hereby certifies that this Transmittal Letter and the paper, as described in paragraph 1 hereinabove, are being deposited with the United States Postal Service with sufficient postage as "Express Mail Post Office to Addressee" in an envelope addressed to: Asst. Commissioner for Patents, Box Provisional Application, Washington, D.C. 20231, on this 6th day of July, 1999. Express Mail No. EM 004668166 US

                                 By: _____

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Introduction

While delivering unique, deep biological information (time, space, and activity) about a drug candidate's physiological impact on specific cellular targets within living cells, the Cellomics™, Inc. ArrayScan™ High Content Screening (HCS) can also produce a large quantity of data. It is essential that this data be managed in a reliable, cost effective manner. Cellomics™ Store takes data management one step further by ensuring that the HCS, and in the future UHTS data, is available to support the findings knowledge in the Cellomics™ system for cell-based knowledge management.

As more ArrayScan™ instruments are used at a site, the problem with data management becomes more difficult. Cellomics™ Store summarizes the plate and well level data from multiple ArrayScan™ instruments and stores the values in a Microsoft SQL Server database. The high-resolution image files that are generated from the instrument are numerous and large in size. An archiving solution allows the user to leave these image files in place, without the need for the costly magnetic storage associated with hard disk drives. Cellomics™ Store incorporates these archiving features with the use of a 3rd party product, Seagate Software's Backup Exec™ Storage Migrator for Windows NT.

Visualizing these large amounts of data can also be a problem. Cellomics™ Store features visualization and analytical tools for cross plate analysis at the plate and well level. The analysis can even include complex multiple-feature cross plate analysis.

This guide is written for the Systems Administrator for the Cellomics™ Store system. The document covers the following topics:

- overall architecture of the system,

- setup and installation of system components, and

- maintenance of the system.

Cellomics™, Inc. offers a complete line of products and services that assist in the discovery of new drugs. Available products include:

- **ArrayScan™ Kinetics Workstation** An imaging platform with fluidics and environmental control that allows the capture and understanding of new drug candidates which elicit complex responses over time.

- **Ultra-High Throughput Screening Systems** A modular series of workstations that combine to form a high-speed integrated drug discovery platform.

- **Bioinformatics Software** Products for transforming high content cell data into knowledge of cellular pathways.

- **Assay Development Services** An extensive program for custom development of complete assays optimized for high throughput, high content cellular screens.

About this Guide

The chapters that follow this introduction are:

Chapter 1 describes the basic principles of the Cellomics™ Store system and includes a description of the system components and functions.

Chapter 2 provides a description of the system architecture and includes a system diagram.

Chapter 3 describes the Cellomics™ Store server including a description of the hardware and software configurations. The Microsoft SQL Server relational database configuration is also described.

Chapter 4 outlines procedures for ....

Chapter 5 describes how to ... .

Appendix A .... Appendix B...

Contacting Technical Support

If you have a technical question that you are unable to answer after consulting the documentation, please contact Cellomics™ technical support via e-mail at support@cellomics.com or contact your Cellomics™ account manager. Before you contact us, it is helpful if you are prepared to answer the following questions:

- What were you doing when the problem occurred?

- Can you reproduce the problem?

- Did you try to solve the problem? If so, what steps did you take and what did you observe?

- Which error messages, if any, appeared?

Having these answers will help us provide you with a solution as quickly as possible.

Basic Principles of the Cellomics™ Store System

The Cellomics™ Store system is comprised of four major components:

- Cellomics™ Store Server

- Cellomics™ Store Client

- Cellomics™ Store API

- Archive Manager

These components perform the following functions:

- data storage,

- data retrieval and analysis, and

- data archival.

This chapter provides a description of each of these functions. A detailed description of each of the components is presented in Chapter ??

Data Storage

Database Server

The database server or relational database management system for Cellomics™ Store is Microsoft's SQL Server. The database system collects all of the summarized plate and well information from the ArrayScan™ instruments. Since the database supports the standard SQL language, data viewing and retrieval is possible using a wide variety of tools and techniques.

File Server

The ArrayScan™ instruments generate a large amount of data represented by cell and field level raw data values and images. The raw data values are stored as simple database files, and the images are stored in a standard graphic file format. These files reside in a special area on the Cellomics™ Store server designated as the File Server. This area on the server is accessible to users on the Local Area Network (LAN) who have the appropriate permissions to view these files. The Cellomics™ Store client must have access to this area.

File Spooling

As described in the previous paragraph, the ArrayScan™ stores its' data in database files and image files. At the end of each scan, these files are "spooled" or copied onto the File server, and upon confirmation are deleted from local storage on the ArrayScan™ instrument PC to prevent the disk drive from running out of space.

Data Retrieval and Analysis

Data Visualization

The Cellomics™ Store client provides many ways in which to visualize the data and images from the ArrayScan™ instruments. The analysis can be done on plate and well data for a single plate or across multiple plates. The analyses can incorporate many features for wells or plates and can be viewed graphically or in tabular form. Drilldown capabilities to cell data and images are also available.

Application Programmer's Interface (API)

The Cellomics™ Store API provides a concise mechanism for a user to retrieve plate data or to add specific well features to the Cellomics™ Store database. The API is intended to be used by a programmer using a third party product such as *Microsoft Excel* or *Microsoft Visual Basic 5.0*. The API provides a layer on top of the database, to prevent code changes on the user end if the database should happen to change.

Data Archival

Hierarchical Storage Management

The HSM technology provides a means to allow on-line access to large amounts of virtual disk space. It is desirable in the Cellomics™ Store system to have access to the maximum amount of the plate data and images. This would be very costly if implemented using regular disk storage technology, however HSM provides a more cost-effective solution. HSM provides an archival mechanism that implements a three-tier storage hierarchy, providing the user with virtually infinite on-line or near-line file access. This is accomplished by combining the HSM product with an optical jukebox and DLT tape library.

File Backup

This differs from HSM as physical copies of critical data and files are made and stored offline for later retrieval or in case of catastrophic failure of hardware. These backups should occur at regular intervals and should be managed at the department or central IS level.

Note: The HSM process should NOT take the place of regular backups.

System Architecture

The Cellomics™ Store 1.0 system is the data management and storage system used in conjunction with the Cellomics™ ArrayScan™ instrument. As described earlier, the Cellomics™ Store system is comprised of four major components. The client is a stand-alone Visual Basic application that is installed on each workstation that will access the Cellomics™ Store database. The Cellomics™ Store Server is the physical server machine that hosts the Cellomics™ Store database in the Microsoft SQL Server relational database management system. The Hierarchical Storage Manager which also resides on the server machine, is Seagate Software's Backup Exec/Storage Migrator.

Basic Concepts

The Cellomics™ Store 1.0 system is a client/server database system. In this system, the client is the Cellomics™ Store client and the server is the Cellomics™ Store server, running the SQL Server database. The client can be on any PC machine meeting the minimum hardware/software requirements or it can reside on the Cellomics™ Store server itself. Also, there is a mode in which the Cellomics™ Store client can run in a "stand-alone" mode; where it will house the data in a Microsoft Access database. In this case, the system will not be running in a client-server mode.

Assumptions

It is assumed that the customer has various IT resources and procedures in place when the Cellomics™ Store system is delivered. Among these resources is a systems administrator for the Cellomics™ Store server. This administrator should be in charge of maintenance on the SQL Server database, regular system backups and general maintenance on the server machine. A backup procedure should be in place to ensure complete protection against catastrophic failures of the disk devices on this machine. A backup procedure is not described in any detail in this document.

System Diagram

The following diagram depicts the high level architecture of the Cellomics™ Store system:
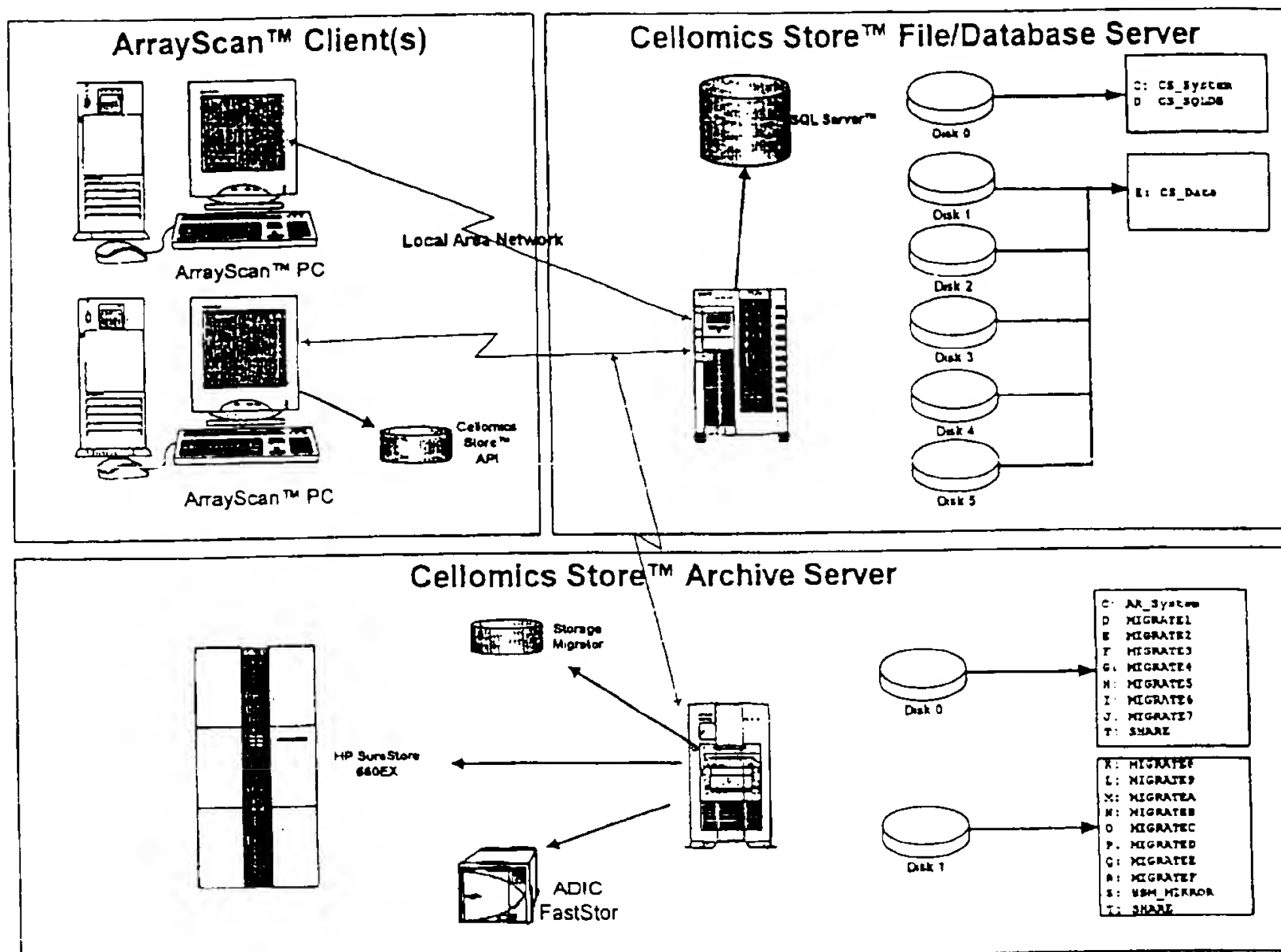

Figure 2.1 Cellomics™ Store System Configuration

Cellomics™ Store Server

The Cellomics™ Store server consists of the following hardware and software configuration:

Hardware

- At least one single-processor server grade machine (>300 MHz, 256 MB RAM recommended).

- 17" Monitor

- (4) 18 GB SCSI Disks

- 56 KB Internal Modem

If the system is to be equipped with archive capabilities, the following additional hardware is recommended:

- High-density SCSI DLT library device

- HP SureStore 660ex Optical Jukebox – 660 GB with 6 Drives

- HP 4.8 GB Optical Media

Software

- Windows NT Server version 4.0; service pack 4 (5 user license)

- SQL Server 7.0 (5 user license)

- Storage Migrator, version 2.51 (1000 GB license)

Windows NT

The Windows NT 4.0 Server software is a standard configuration, using TCP/IP as the networking protocol. It is assumed that the Cellomics™ Store server is located on a high speed Ethernet LAN, using a minimum of 100 mpbs. The 5 person license is installed on a per-seat basis, allowing for the addition of licenses at a future date.

Disk Configuration -

Hard disks on the Cellomics™ Store file server are configured as follows:

Disk	Recommended Size	Drive	Label	Description
Disk 0	4000 MB	C:	CS_System	System disk; Windows NT; Program Files

Disk	Recommended Size	Drive	Label	Description
Disk 0	12000 MB	D:	CS_SQLDB	SQL Server database files
Disk 1	17000 MB	E:	CS_Data	Data file area (VOLUME SET)
Disk 2	17000 MB	E:	CS_Data	Data file area (VOLUME SET)
Disk 3	17000 MB	E:	CS_Data	Data file area (VOLUME SET)
Disk 4	17000 GB	E:	CS_Data	Data file area (VOLUME SET)
Disk 5	17000 GB	E:	CS_Data	Data file area (VOLUME SET)
CD-ROM0		Z:		CD-ROM *

Table 3.1 – Disk Partition Details

Hard disks on the Cellomics™ Store Archive server are configured as follows:

Disk	Recommended Size	Drive	Label	Description
Disk 0	3000 MB	C:	(Optional)	System disk; Windows NT; Program Files
Disk 0	700 MB	D:	Migrate1	1st migration partition
Disk 0	700 MB	E:	Migrate2	2nd migration partition
Disk 0	700 MB	F:	Migrate3	3rd migration partition
Disk 0	700 MB	G:	Migrate4	4th migration partition
Disk 0	700 MB	H:	Migrate5	5th migration partition
Disk 0	700 MB	I:	Migrate6	6th migration partition
Disk 0	700 MB	J:	Migrate7	7th migration partition
Disk 1	700 MB	K:	Migrate8	8th migration partition
Disk 1	700 MB	L:	Migrate9	9th migration partition
Disk 1	700 MB	M:	MigrateA	10th migration partition
Disk 1	700 MB	N:	MigrateB	11th migration partition
Disk 1	700 MB	O:	MigrateC	12th migration partition
Disk 1	700 MB	P:	MigrateD	13th migration partition
Disk 1	700 MB	Q:	MigrateE	14th migration partition
Disk 1	700 MB	R:	MigrateF	15th migration partition
Disk 1	250 MB	S:	HSM Mirror	Mirror area for Storage Migrator
Disk 1	3000 MB	T:	Share	
CD-ROM0				CD-ROM *

Table 3.1 – Disk Partition Details (continued)

* The CD-ROM is labeled as "Z:" so it will not interfere with the future addition of disk drives.

SQL Server

The Microsoft SQL Server relational database is configured with the following settings:

Configuration Setting	Value(s)
Root Directory	C:\MSSQL7
Master Database Path	C:\MSSQL7\DATA\MASTER.DAT
Error Log Path	C:\MSSQL7\LOG\ERRORLOG
Database Devices	

Cellomics™ Store Database	Name:	Store_Data
	Location:	C:\MSSQL7\Data\Store_Data.MDF
Cellomics™ Store Log	Name:	MV_Log
	Location:	C:\MSSQL7\Data\Store_Log.LDF

Table 3.2 Microsoft SQL Server configuration

The following roles and users are setup within SQL Server (Roles are in **bold**):

Roles/Users	Permissions
Cellomics	All permissions
ArrayScan	- member of
Multiview	- member of
Operators	All permissions
Investigators	All permissions
Reviewers	Read Only permissions

Table 3.3 – Roles and groups

Tables

This section includes a listing of the tables and views in the Cellomics™ Store SQL Server database. To view the source code for these procedures, use the "*Microsoft SQL Enterprise Manager*" application.

Table	Description
Algorithm	Assay Information
AlgorithmFeature	Assay Information
AlgorithmInstrument	Assay Information
AssayParams	Parameters for current assay
CSLog	System Table
DBVersion	System Table
FeatureLevels	System Table
FeatureType	List of features
FormFactor	Plate layout geometry
InstrumentType	System Table
Manufacturer	List of manufacturers
Plate	List of all plates
PlateDocument	Plate data details
PlateFeature	Mapping of features to plates
PlateRow	Used for reporting
PlateStack	Batch Information
Protocol	Protocol information
ProtocolAssayParams	Protocol information
ProtocolAutoExposeParam	Protocol Information
ProtocolAutoFocusParam	Protocol Information
ProtocolChannel	Protocol information
ProtocolChannelAutoExposeParam	Protocol Information
ProtocolChannelOverlay	Protocol information
ProtocolChannelRejParam	Protocol information
ProtocolOverlay	Protocol information
ProtocolScanArea	Protocol information
ProtocolWellFeature	Protocol information
Run	Batch Information

Table	Description
RunList	Batch Information
SaveMode	Data retention Information
Well	Well details
WellFeature	Mapping of features to wells
zError	System Table
zPlateInformation	System Table
zReport	System Table
zStatus	System Table
zSystem	System Table
zSsytemList	System Table
zSystemReportList	System Table
zSystemToDo	System Table
zUser	System Table
zUserFeature	System Table

Table 3.4 – Cellomics™ Store SQL Tables

Stored Procedures and Triggers

This section includes a listing of the stored procedures and triggers in the Cellomics™ Store SQL Server database. To view the source code for these procedures, use the "*Microsoft SQL Enterprise Manager*" application.

Type	Name	Description
Trigger		
	Plate_Complete	Summary table builder
	Cleanup_platedata	Cascading delete for the Plate table
	P1F_Insert	System Trigger
	Well_insert_trigger	System Trigger
	WellFeat_in_trigger	System Trigger
	Zpl_info_insert	System Trigger
Stored Procedure		
	Arrayscan Plate Status Report	Status Report
	Arrayscan_Status	Status Report
	Arrayscan_Status2	Status Report
	Build12Cols	Used by BuildPlateRow
	Build24Cols	Used by BuildPlateRow
	Build48Cols	Used by BuildPlateRow
	BuildASID	System Procedure
	BuildPlateRow	Build summary table
	Check_space	Database Utility
	Check_space2	Database Utility
	Clean_Summary_Tables	Delete old summary information
	CS_Mark_Old_Plates	Data retention procedure
	CS_Plate_Delete	Data retention procedure
	CS_Protocol_delete	Data retention procedure
	CS_Scheduled_Deletes	Data retention procedure
	CS_SM_Mark_Plates_98	Data retention procedure
	CS_SM_Plates_98	Data retention procedure
	CS_SM_Scheduled_Del_98	Data retention procedure

Type	Name	Description
	Get_zsystemlistid	System Procedure
	GetPlates	System Procedure
	GoldPlates	System Procedure
	PlateBuilder	Used for BuildRow

Table 3.5 – Triggers and Stored Procedures in Cellomics™ Store

Cellomics™ Data Viewer

The Cellomics™ Store Data Viewer installation consists of a single self-extracting executable file. Click on the "SETUP.EXE" file to start the installation process. The install will default to the `C:\CellApps\ArrayScan20` directory. The installation of the client assumes that an ODBC Datasource has been created. The recommendations for this Datasource are as follows:

Setting	Value
Driver Name:	SQL Server
Driver Version:	3.70.06.23 (11/05/1998)
Driver Mfg.	Microsoft Corp.
Datasource Name:	Store
Server:	CellStore (Installation Dependent)
Authentication:	Use SQL Server
Login ID:	Arrayscan
Password:	Arrayscan
Default database:	Store
<accept defaults for remaining settings>	

Table 4.1 – ODBC Datasource settings

Refer to the Cellomics™ Data Viewer User's Guide for instructions on using this application.

Cellomics™ Store API

The Cellomics™ Store API consists of one file, mvPlateData.dll. This file should be installed in its own directory (C:\CellApps\MultiViewAPI), and should be registered with the REGSVR32.EXE application. The purpose of this API is to provide an application interface to the Cellomics™ Store database. An ODBC Datasource is assumed to be created before using the API. Refer to table 4.1 for recommendations. The API provides access to plate information, well details and provides a facility to enter well features. It is intended to be a custom interface between Cellomics™ Store and the customers in-house Screening system. This API may change to reflect updates to the structures within the database. See the API users guide on information as to the functionality of this module.

Archive Manager

The Archive Management process in Cellomics™ Store is implemented using the Hierarchical Storage Management (HSM) technology offered in the 3rd party product, Seagate Software's *Backup Exec Storage Migrator*. This package provides all the facilities necessary to handle the automatic archiving of image and database files on the Cellomics™ Store server. Numerous parameters can be set to customize the attributes of the archival process. Storage Migrator is the interface to the HP SureStore optical jukebox and the *adic* FastStor DLT drive. Assuming that the jukebox and DLT drive have the appropriate media, the system essentially has access to over 1 terabyte of near-line storage. See the users guide for additional details on this products' functionality.

Basic Configuration

The installation has the following basic configuration settings:

Setting	Value
System Drive:	C:
Migrate Partition(s):	D: MIGRATE1
	E: MIGRATE2
	F: MIGRATE3
	G: MIGRATE4
	H: MIGRATE5
	I: MIGRATE6
	J: MIGRATE7
	K: MIGRATE8
	L: MIGRATE9
	M: MIGRATEA
	N: MIGRATEB
	O: MIGRATEC
	P: MIGRATED
	Q:MIGRATEE
	R:MIGRATEF
Database mirror:	S. HSM MIRROR
Managed Server:	
Managed Partitions:	
File Backup Requirement	Enabled; No rotation scheme
Volume Management Defaults	
Critical	60%
Acceptable	50%
Optimal	40%

Table 6.1 – Storage Migrator settings

The HSM backup process requires that a tape be in the internal tape drive at all times. The backup process only copies the information needed to re-create files for the HSM system, and

should not replace a regular system backup. It is important to check the status of the backup tape on a regular basis. Occasionally the system will post a message indicating that a tape needs to be changed, when this happens, label a new tape as indicated in the message, and replace the old tape with the new one.

Job Definitions

The following jobs are defined for optical system performance:

Job Name	Type	Occurrence	Additional Info
Daily Sweep	SWEEP	Daily, 12:00-14:00	##*$
DAY1 – MON Migrate	MIGRATE	Week Day – Wed, 00:00-00:15	##*$; \Cellomics\Data\Plates\MON*.*+
DAY2 – TUE Migrate	MIGRATE	Week Day – Thu, 00:00-00:15	##*$; \Cellomics\Data\Plates\TUE*.*+
DAY3 – WED Migrate	MIGRATE	Week Day – Fri, 00:00-00:15	##*$; \Cellomics\Data\Plates\WED*.*+
DAY4 – THU Migrate	MIGRATE	Week Day – Sat, 00:00-00:15	##*$; \Cellomics\Data\Plates\THU*.*+
DAY5 – FRI Migrate	MIGRATE	Week Day – Sun, 00:00-00:15	##*$; \Cellomics\Data\Plates\FRI*.*+
DAY6 – SAT Migrate	MIGRATE	Week Day – Mon, 00:00-00:15	##*$; \Cellomics\Data\Plates\SAT*.*+
DAY7 – SUN Migrate	MIGRATE	Week Day – Tue, 00:00-00:15	##*$; \Cellomics\Data\Plates\SUN*.*+
Daily Shutdown	SHUTDOWN	Daily, 05:45-06:15	
Daily Migrate	MIGRATE	Daily, 02:00-02:30	##*$, \Cellomics\Data\Plates*.*
			##*$, \Cellomics\Data\Images*.*

*Denotes managed server shared drive letter

*Table 6.2 – Job Definitions for optical system performance*

Note: For file recall notification, the File Recall Notifier must be installed. This client should be installed on any machine that needs recall notification when recalling archived files.

System Checklist

The system checklist is a step by step description of procedures to ensure a proper installation of the Cellomics™ Store system.

1) Make sure all cables and connections are in place before booting the Cellomics™ Store server (see Appendix X for more information).

2) Boot the Cellomics™ Store server by pressing the power button (see figure below).
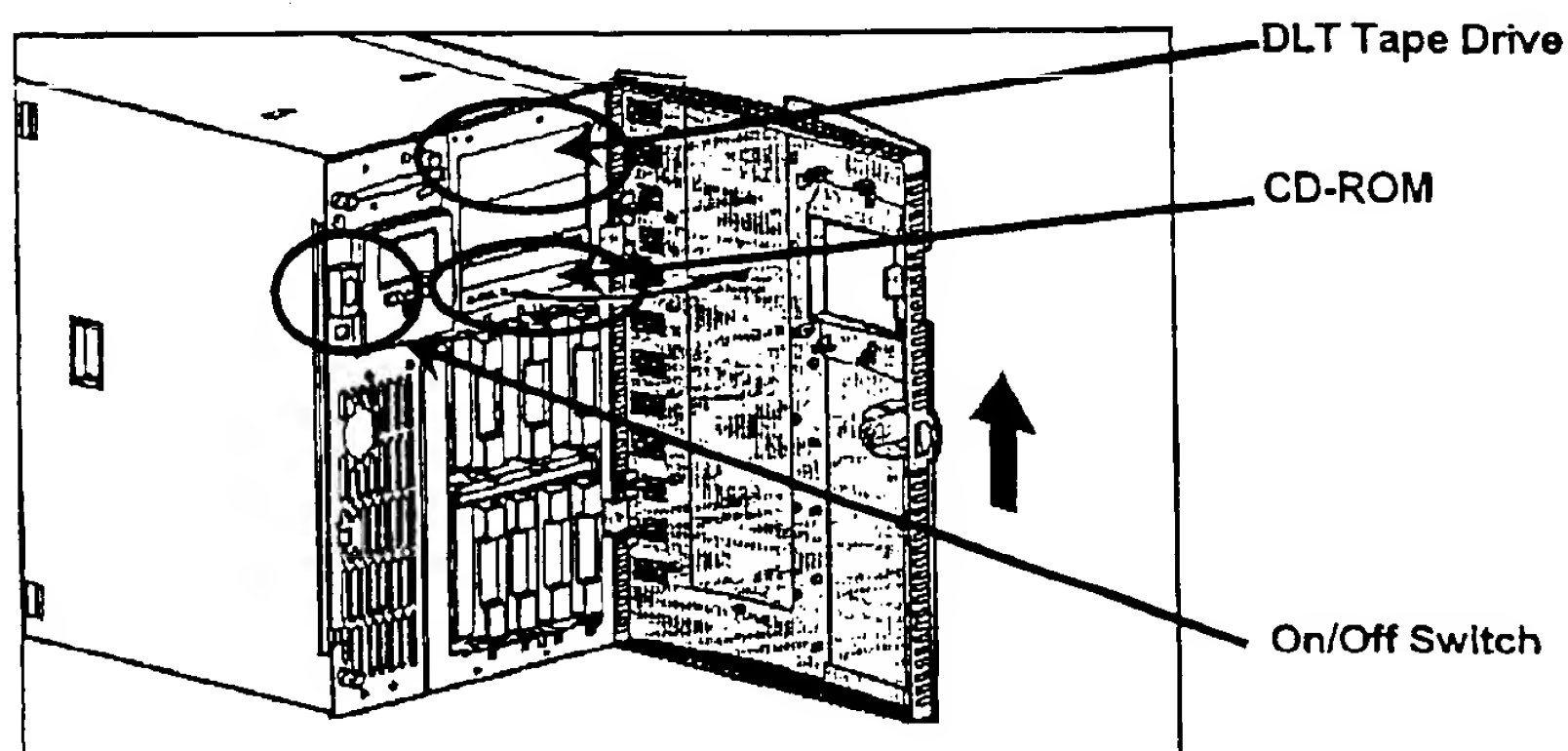
3) If your system is equipped with an Archive Server, boot the archive server by pressing the power button (see figure below).
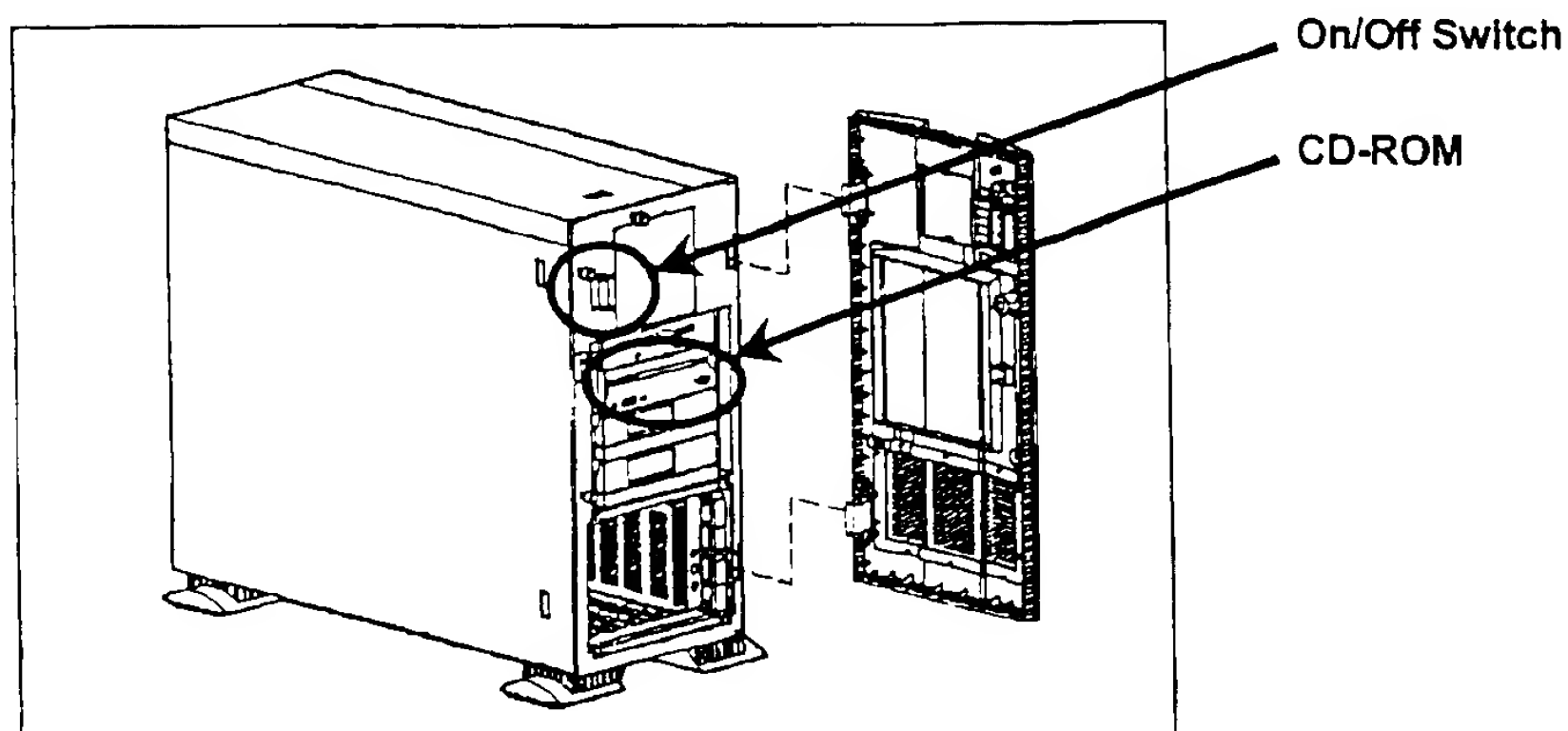
4) If any changes to the SCSI configuration are necessary, press the <Ctrl>-A key combinations when prompted during the boot-up process in the SCSI-Select utility. The devices were installed with the following SCSI device ids:

Adapter #	SCSI Device	SCSI id
1	Compaq HC0183172A	0
1	Compaq HC0183172A	2
1	Compaq HC0183172A	3
1	Compaq HC0183172A	4
1	Compaq HC0183172A	5
1	Compaq HC0183172A	6
1	Compaq Proliant SCSI Scanner	7
2	Compaq DLT7000 SCSI	2

Table 7.1 – SCSI Settings for Database/File Server

Adapter #	SCSI Device	SCSI id
1	HPC113J	0
1	HPC113J	1
1	HPC113J	2
1	HPC113J	3
1	HPC113J	4
1	HPC113J	5
1	HPC1107J	6
2	Quantum DLT	4

Table 7.2 – SCSI Settings for Archive Server

4) When the boot menu appears, select the option "Windows NT Server Version 4.00". This should be the default.

5) When the NT login dialog box appears, enter the following information in order to complete the login process:

User: **Administrator**

Password: _____

Domain: _____

6) Check the status of the Microsoft SQL Server database by doing the following from the NT 4.0 Start menu:

From the Windows® **Start** menu, select **Programs**. Choose the **Microsoft SQL Server 7.0** folder and then select **SQL Service Manager.**

The SQL Server Service Manager dialog box appears.

7) Select "CELLSTORE02" from the Server drop down menu, if not already selected. Verify that the "SQLServerAgent" and "MSSQLServer" have been started by doing the following:

From the Services drop down menu, select **SQLServerAgent.** Verify that the Start/Continue button is selected. If it is not, click the Start/Continue button. Repeat these steps for the MSSQLServer services option.
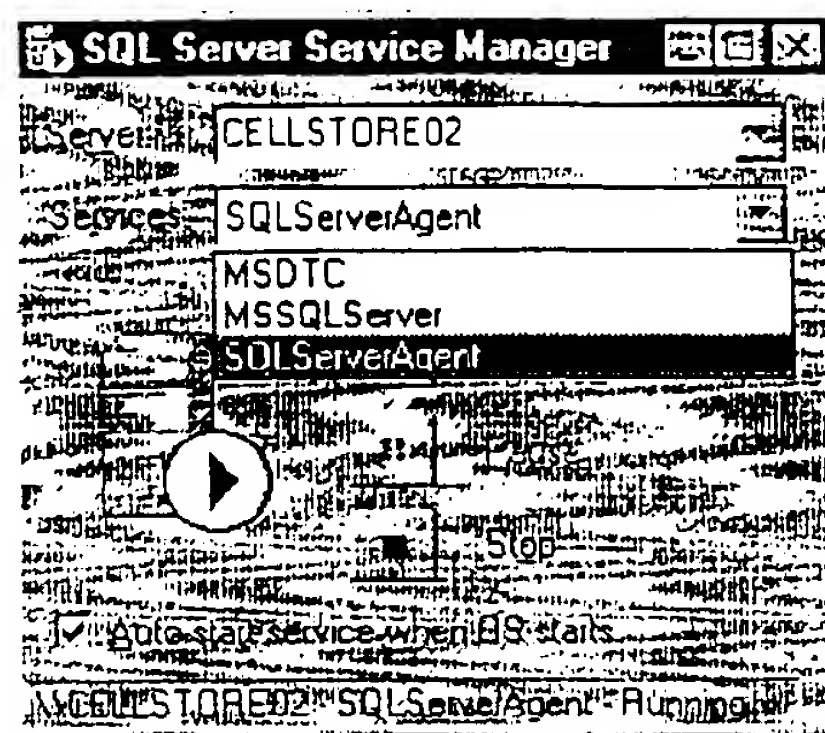

Figure 7.2 – SQL Service Manager

8) To further analyze the status of Microsoft SQL Server, start the SQL Enterprise Manager, by doing the following:

From the Windows® **Start** menu, select **Programs.** Choose the **Microsoft SQL Server 7.0** folder and then select **Enterprise Manager.**
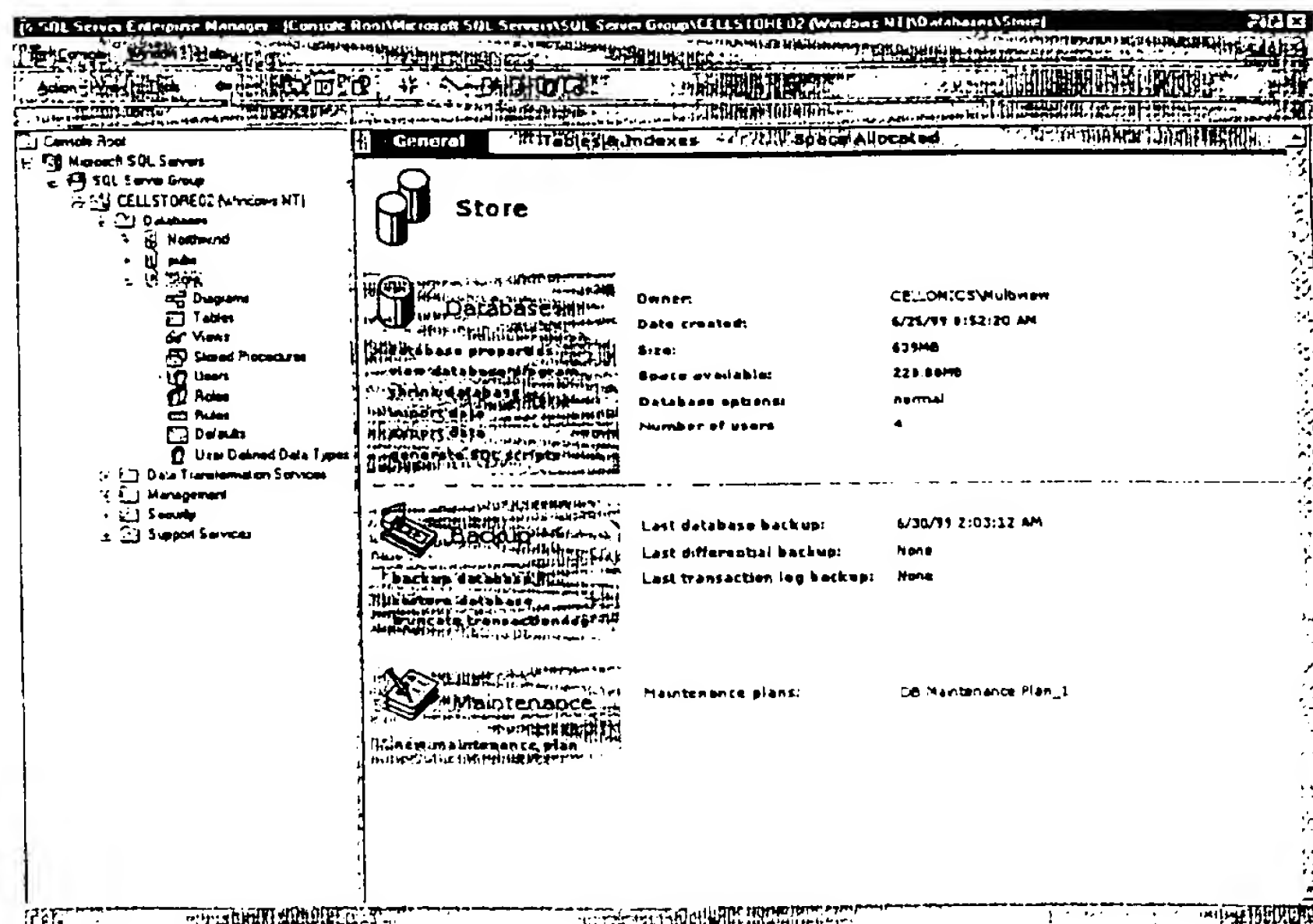
The SQL Services Enterprise Manager window opens.

Figure 7.3 – SQL Enterprise Manager

9) From the SQL Services Enterprise Manager, select the "CELLSTORE02" from the SQL7.0 tree. From the **Server** menu, select **Error Log** to view the database error log.

10) Inspect the error log and note any fatal errors or something that does not look like a standard message. Report these items to local Database Administrator or to Technical Support.

11) Now check the status of Storage Migrator by doing the following:

From the Windows® **Start** menu, select **Programs**. Choose the **Storage Migrator** folder and then select **Storage Migrator Administrator Interface.**

The Storage Migrator window opens.

12) Three main windows are visible from the Administrators Interface: the HSM Monitor, the Enterprise Monitor, and the Job Monitor. If these windows are not open, open them by selecting the window from the View menu.
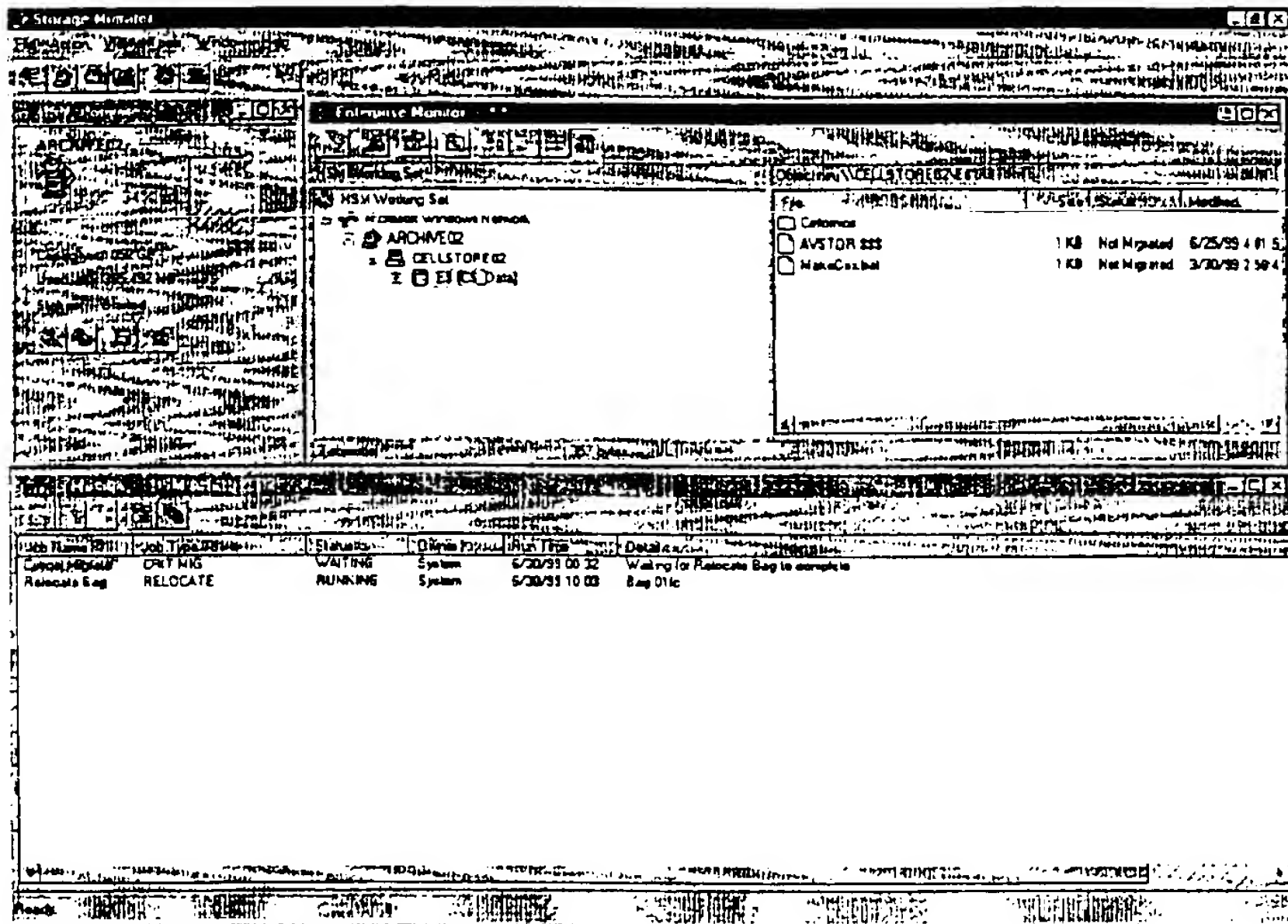

Figure 7.4 – Storage Migrator Main Window

13) Check the status of the license key and capacity by clicking the properties button on the HSM Monitor window. The Status tab is displayed.
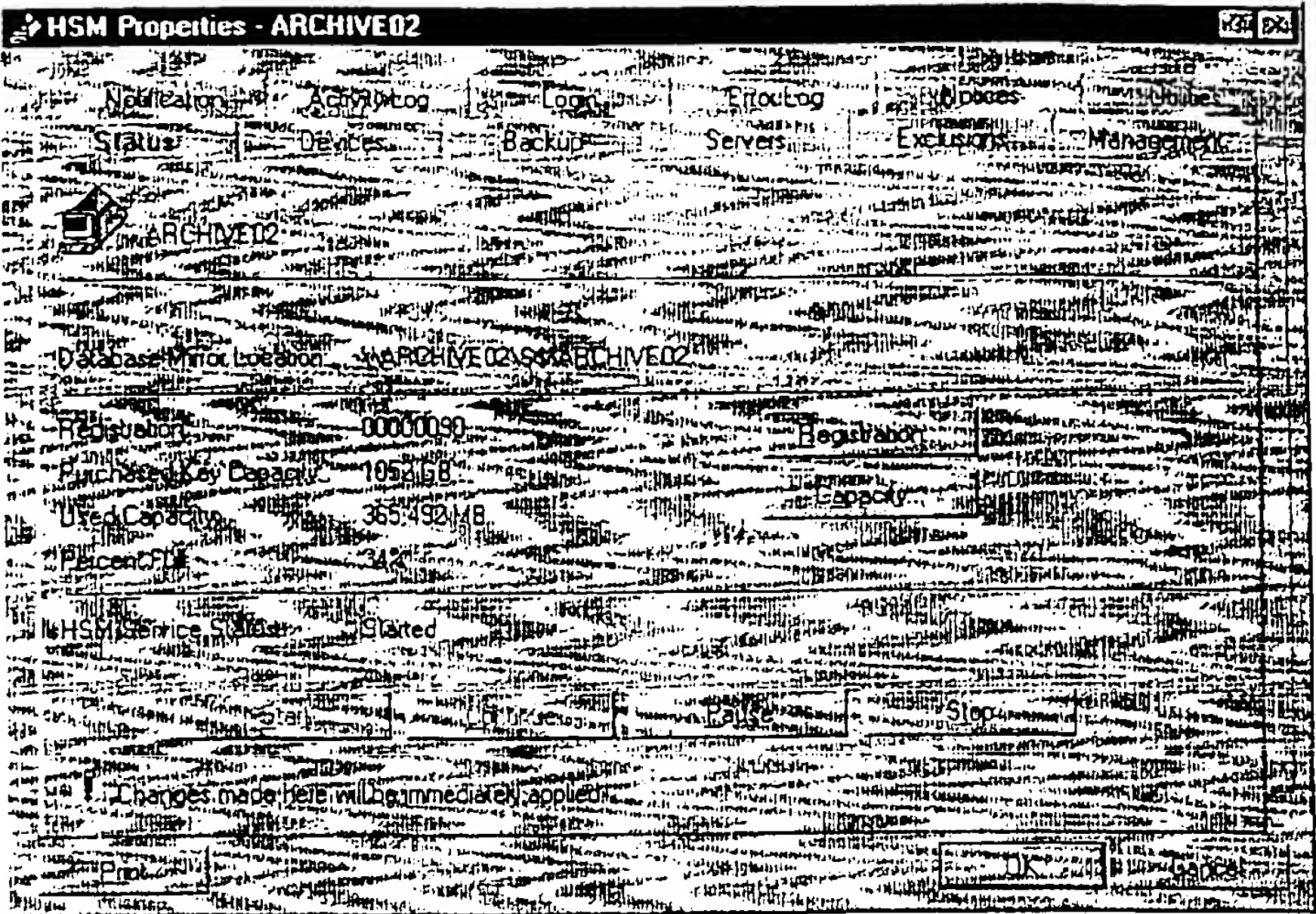
Figure 7.5 – HSM Status

Check the following settings:

Setting	Expected Value
Registration	000080CF
Purchased Key Capacity	1052 GB
Used Capacity:	<GB Used>
Percent Full	<Percent Used>
HSM Service Status	Started

Table 7.3 – Storage Migrator License Settings

14) The Used Capacity should be less than the Purchased Key Capacity. Also, the Percent Full should be under 100%. If either of these values are not as expected, report this to Cellomics™ Technical Support.

15) The next item to check is the Error Log. Select the Error Log tab on the HSM Properties dialog box. Check the error log for any items that seem to be out of the ordinary. Report these items to Cellomics™ Technical Support.
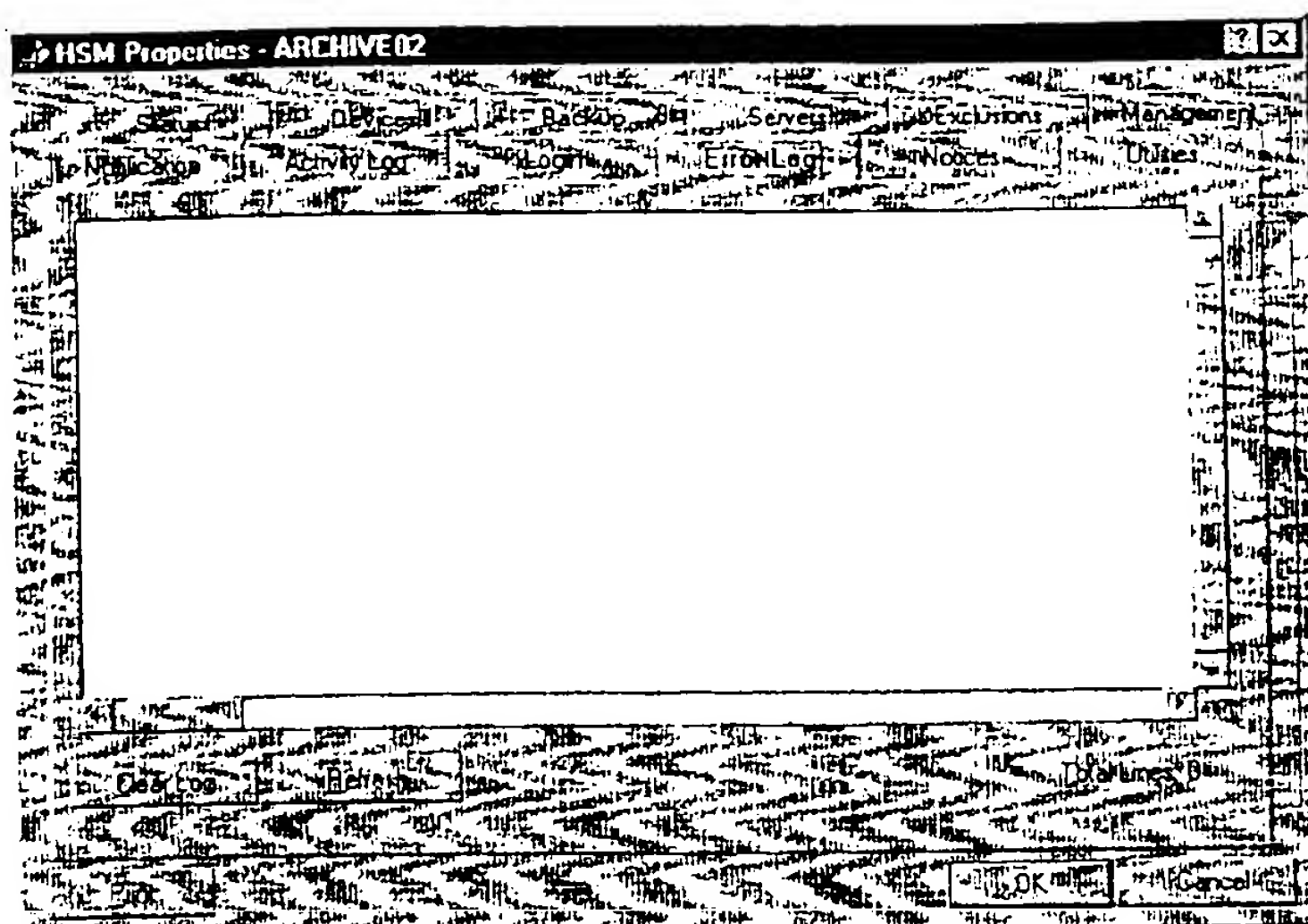
Figure 7.6 – HSM Error Log

16) The last item to check is the Notices. Select the Notices tab on the HSM Properties dialog box. Check the notices for any items that need immediate attention. Report items that seem to be out of the ordinary to Cellomics™ Technical Support.
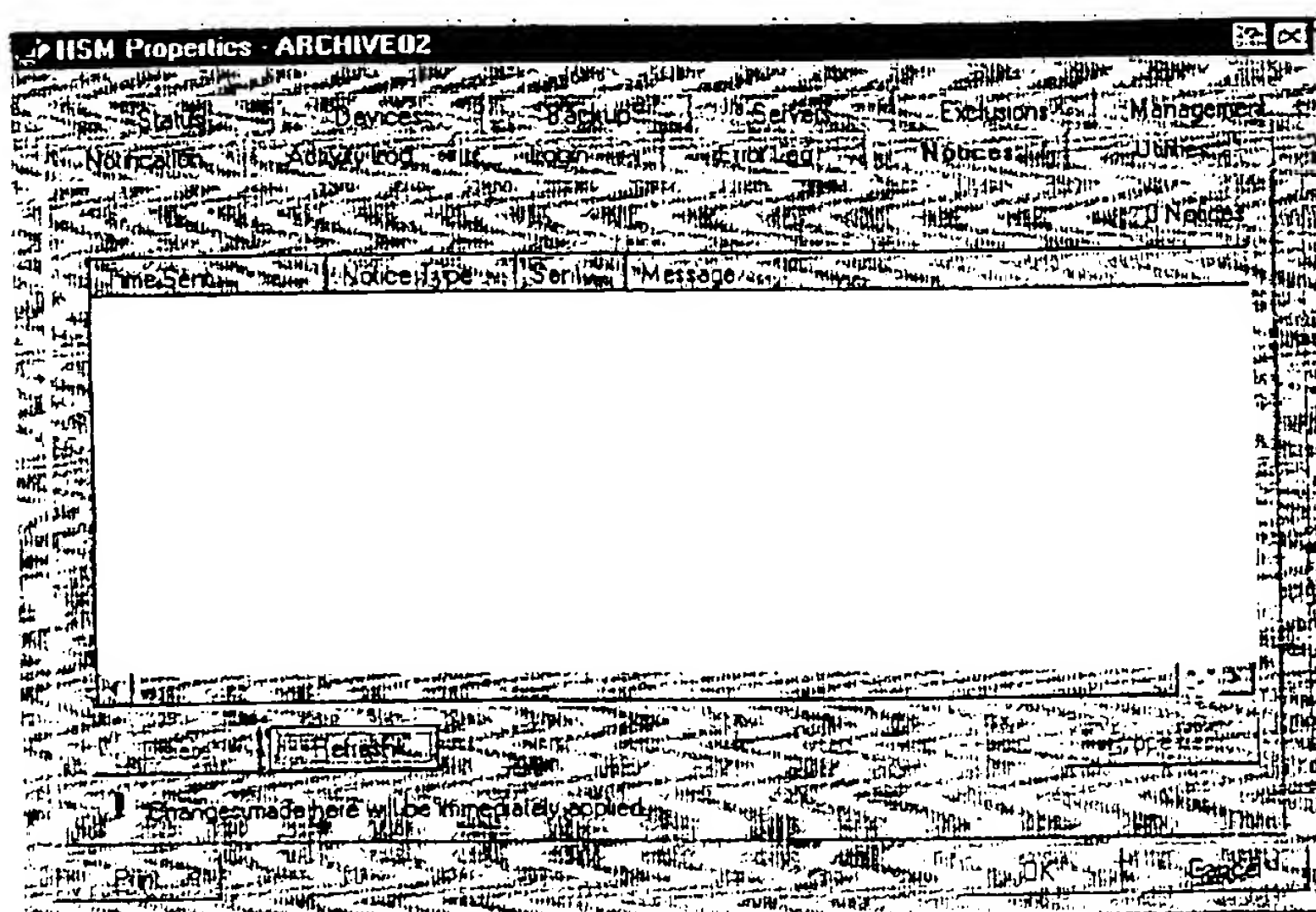

Figure 7.7 – HSM Notices

Hardware Installation Notes

This Appendix provides instructions for re-connecting the components of the Cellomics™ Store system should you need to move them after initial installation.

Note: The power to the server should be off before attempting to change any cable configuration. Failure to comply with this suggestion could result in system malfunctions.

SCSI Connections

The *adic* DLT library external SCSI device is connected to the Cellomics™ Store Archive Server via an external SCSI port. Figure 8.1 shows the position of the external connection:
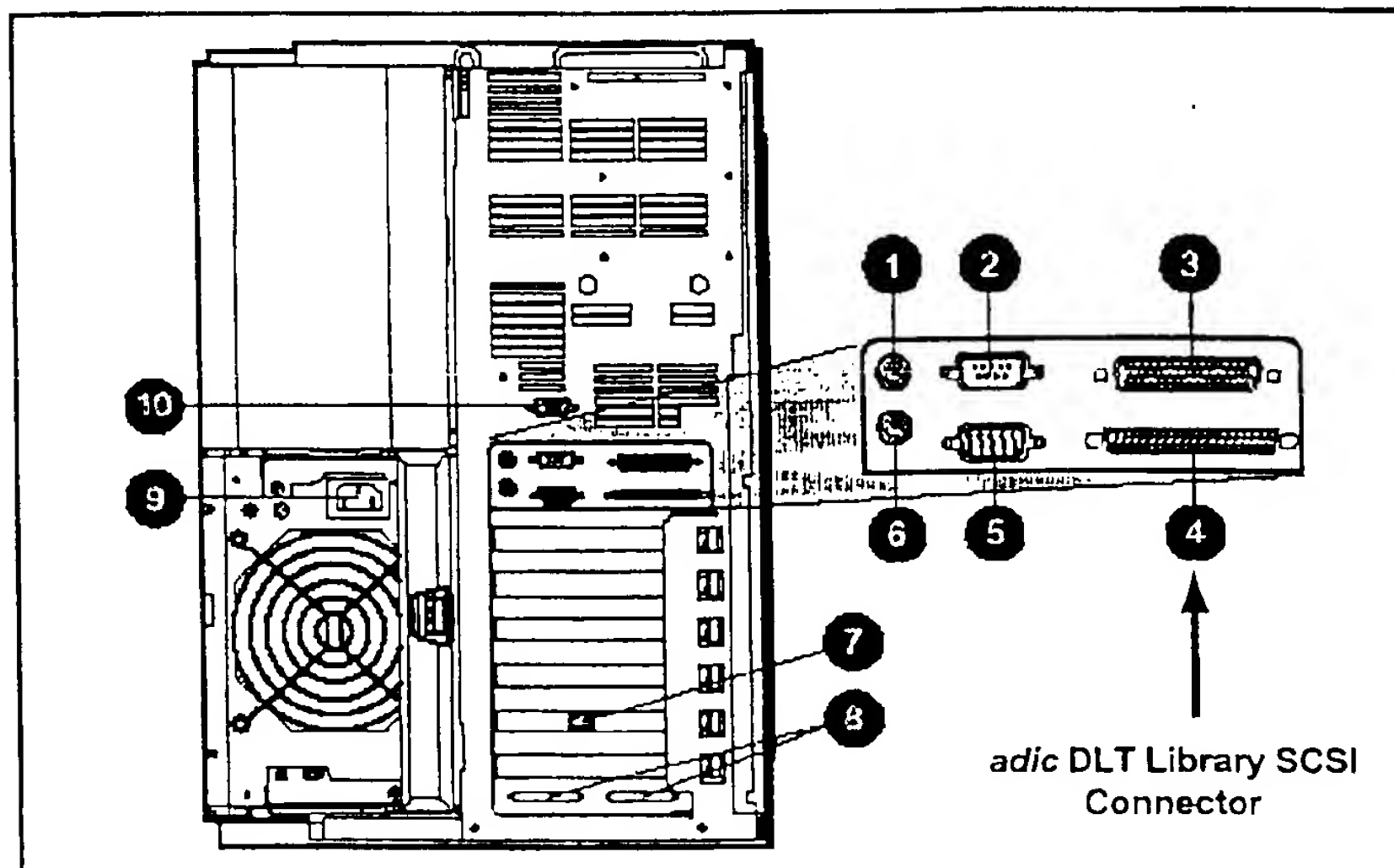

Figure 8.1 – Compaq Proliant 1600 Archive Server External SCSI Connection.

The adic FastStor is then connected to the HP SureStore jukebox as shown in Figure 8.2. The jukebox is terminated with an active terminator. Note that the **SELECT** switch should be set to the **SINGLE-ENDED MODE** position (see Figure 8.3). A Green LED light should be present when the device is powered on. See the respective user guides for additional information concerning the device installation.
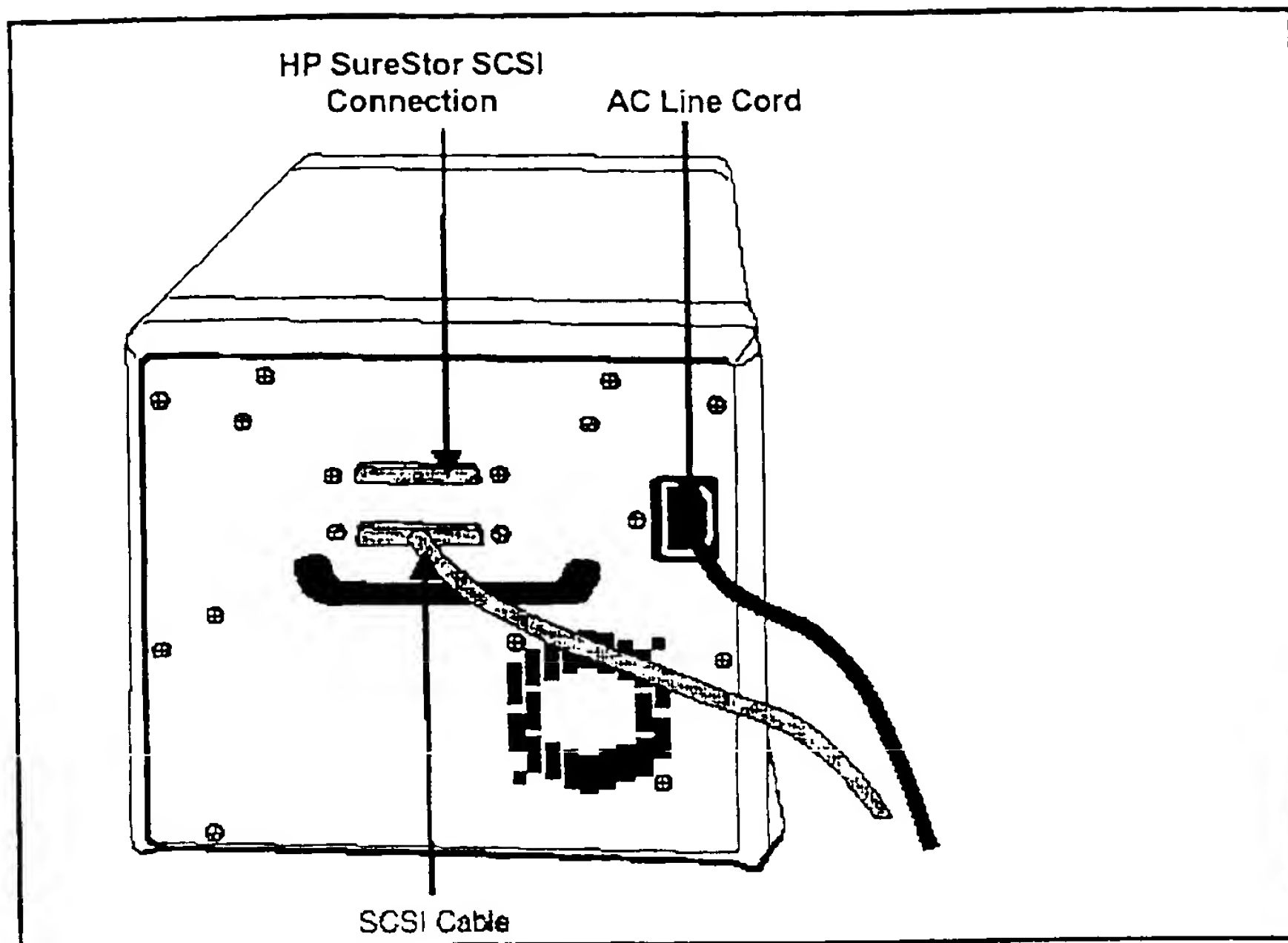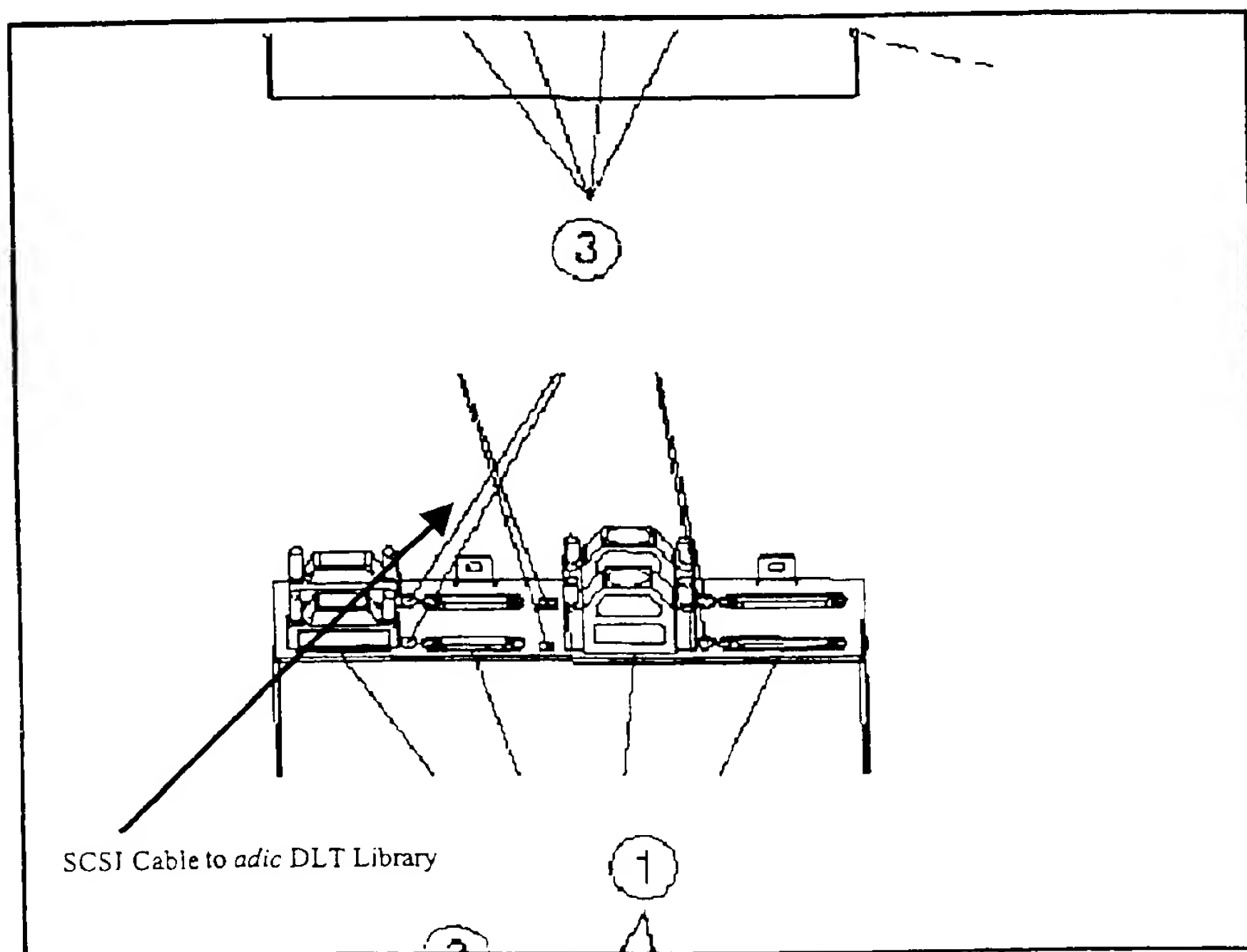
Figure 8.2 – adic DLT 7000 External SCSI Connection

Figure 8.3 – HP SureStore External SCSI Connection

Glossary of Terms

ADO (Active X Data Objects)

ADO (ActiveX Data Objects) is an application program interface from Microsoft that lets programmers writing Windows applications get access to relational and nonrelational databases from both Microsoft and other database providers. ADO is an object-oriented interface.

API

Application Program Interface An interface between the operating system and application programs, which includes the way the application programs communicate with the operating system, and the services the operating system makes available to the programs. For example, an API may make it possible for programs that run under it to open windows and display message boxes.

Database Management System

(DBMS) A complex set of programs that control the organization, storage and retrieval of data for many users; extensively used in business environments. Data is organized in fields, records and files. A database management system must also control the security of the database.

Database Server

(DBS).A computer in a local area network that maintains a database and performs searches for client computers.

DLT

Digital Linear Tape. A type of 1/2" wide magnetic tape used for backup.

FAT

A file allocation table (FAT) is a table that an operating system maintains on a hard disk that provides a map of the clusters (the basic unit of logical storage on a hard disk) that a file has been stored in. When you write a new file to a hard disk, the file is stored in one or more clusters that are not necessarily next to each other; they may be rather widely scattered over the disk. The operating system creates a FAT entry for the new file that records where each cluster is located and their sequential order. When you read a file, the operating system reassembles the file from clusters and places it as an entire file where you want to read it.

File Server

A computer that stores files for access by other computers.

HSM

Hierarchical Storage Management. An automatic system that moves files from hard disk to other storage media after a certain length of time, or according to other specifications of the user.

NTFS

(NT File System) A file system used in Windows NT which uses the Unicode character set and allows filenames up to 255 characters in length. The NTFS is designed to recover on the fly from hard disk crashes. Windows NT supports multiple file systems, and it can run with a DOS FAT, an OS/2 HPFS and a native NTFS, each in a different partition of the hard disk. NT's security features require that the NTFS be used.

Relational Database

A database in the form of tables which have rows and columns to show the relationships between items, and in which information can be cross-referenced between two or more tables to generate a third table. A query language is used to search for data. If data is changed in one table, it will be changed in all related tables. A database that has only one table is called a flat file database.

Relational Database Management System

(RDBMS).A system for database management of a relational database. See relational database and database management system (DBMS).

SCSI

Small Computer Systems Interface. A high-speed interface that can connect to a computer devices such as hard drives, CD-ROM drives, floppy drives, tape drives, scanners, and printers. SCSI can connect up to seven devices; each one is given an identification number from 0 to 7, which is set with a manual switch. Newer versions of SCSI can connect up to 15 devices.

SQL

Structured Query Language. A language used to create, maintain, and query relational databases. It is an ISO and ANSI standard. It is often embedded within other programming languages.

Stored Procedures

An SQL program stored in the database that is executed by calling it directly from the client or from a database trigger. When the SQL procedure is stored in the database, it does not have to be replicated in each client.

TCP/IP

The Transmission Control Protocol (TCP) on top of the Internet Protocol (IP).These protocols enable communication between different types of computers and computer networks. The Internet Protocol is a connectionless protocol which provides packet routing. TCP is connection-oriented and provides reliable communication and multiplexing.

Trigger

A mechanism that initiates an action when an event occurs such as reaching a certain time or date or upon receiving some type of input. A trigger generally causes a program routine to be executed.

In a database management system (DBMS), it is an SQL procedure that is executed when a record is added or deleted. It is used to maintain referential integrity in the database. A trigger may also execute a stored procedure. Triggers and stored procedures are built into DBMS's used in client/server environments.

Document References

Additional information can be obtained from the following reference documents:

1) Storage Migrator version 2.5 manual

2) SQL Server Administrator's Companion

3) SQL Server Setup

4) Microsoft Windows NT Server documentation set

5) ~~Command Server Program System Reference~~

6) *adic* FastStor Installation and Operating Guide

7) HP SureStore 660ex / 1200ex Optical Jukebox User's Guide

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

(Attorney's Docket No. 98,675-D)

Applicant or
Patentee: Keith Boyce, Brian McKenna, Phil Glick

Serial or
Patent No.   __**To be assigned**__   Filed: __**Herewith**__

Title: Data Management and Presentation Methods

VERIFIED STATEMENT CLAIMING SMALL ENTITY STATUS
(37 C.F.R. § 1.9(f) AND § 1.27(c)) - SMALL BUSINESS CONCERN

I hereby declare that I am

☐   the owner of the small business concern identified below:

☒   an official of the small business concern empowered to act on behalf of the concern identified below:

NAME OF CONCERN: **Cellomics, Inc.**

ADDRESS OF CONCERN: **635 William Pitt Way
Pittsburgh, Pennsylvania 15238**

I hereby declare that the above-identified small business concern qualifies as a small business concern as defined in 13 C.F.R. § 121.12, and reproduced in 37 C.F.R. § 1.9(d), for purposes of paying reduced fees to the United States Patent and Trademark Office, in that the number of employees of the concern, including those of its affiliates, does not exceed 500 persons. For purposes of this statement, (1) the number of employees of the business concern is the average over the previous fiscal year of the concern of the persons employed on a full-time, part-time, or temporary basis during each of the pay periods of the fiscal year, and (2) concerns are affiliates of each other when either, directly or indirectly, one concern controls or has the power to control the other, or a third party or parties controls or has the power to control both.

I hereby declare that rights under contract or law have been conveyed to and remain with the small business concern identified above with regard to the invention, entitled **Data Management**

- 1 -

and Presentation Methods
   inventor(s) Keith Boyce, Brian McKenna, Phil Glick

described in

    ☒   the specification filed herewith.
    ☐   Application Serial No. filed
    ☐   Patent No. _____ , issued _____ .

If the rights held by the above identified small business concern are not exclusive, each individual concern or organization having rights in the invention must file verified statements averring to their status as small entities, and no rights to the invention are held by any person, other than the inventor, who would not qualify as an independent inventor under 37 CFR § 1.9(c) if that person made the invention, or by any concern which would not qualify as a small business concern under 37 CFR § 1.9(d), or a nonprofit organization under 37 CFR § 1.9(e).

Each person, concern or organization having any rights to the invention is listed below:

    ☒   No such person, concern or organization exists.
    ☐   Each such person, concern or organization is listed below.

FULL NAME _____

ADDRESS _____

☐ Individual ☐ Small Business Concern ☐ Nonprofit Organization

Separate verified statements are required from each named person, concern or organization having rights in the invention averring to their status as small entities. (37 CFR § 1.27).

I acknowledge the duty to file, in this application or patent, notification of any change in status resulting in loss of entitlement to small entity status prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date on which status as a small entity is no longer appropriate. (37 C.F.R. § 1.28(b))

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application, any patent issuing therein, or any patent to which this verified statement is directed.

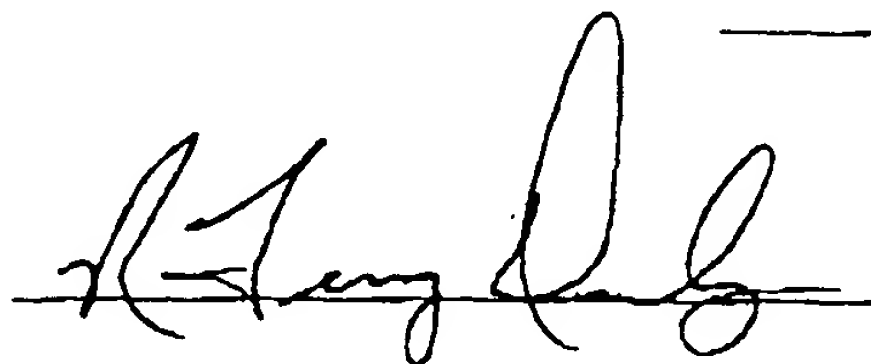NAME OF PERSON SIGNING: _R Terry Dunlay_

TITLE IN ORGANIZATION: _Executive Vice President_

ADDRESS OF PERSON SIGNING: _635 William Pitt Way_
Pittsburgh, PA 15238

Signature: _R Terry Dunlay_

Date: _7/6/99_

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